Operating service manual

Filtertechnik
Filtration, Purification &
Separation Solutions

FRB-49312-SP

Filtertechnik
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Separation Solutions

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Overview
The FRB-49312-SP is a wall mounted filtration system for the removal of particulate of water contamination from diesel fuel.

The self priming pump will deliver up to 50 l/min and is fitted with an over pressure bypass.

The system can be run in the following modes:

- ON/OFF manual
- TIMED (7 day timer)

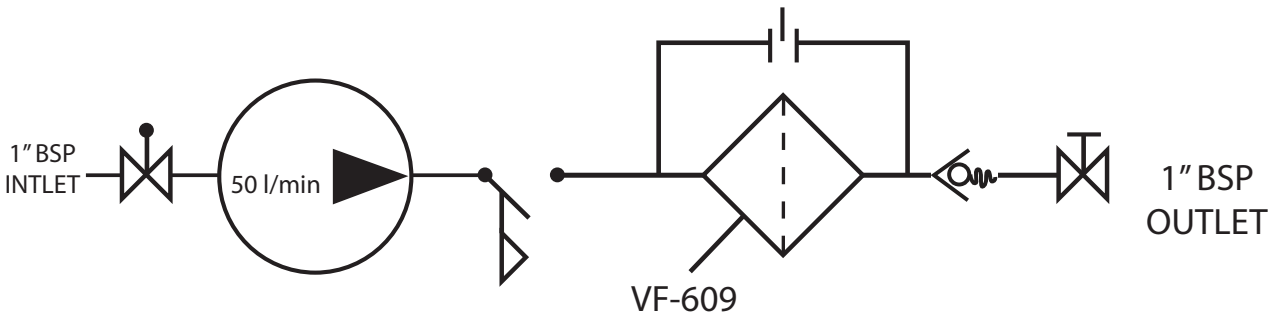
The FRB-49312-SP is fitted with a flow switch for low pressure or dry run protection and a bund alarm for if the drip tray should become flooded. These conditions will trigger system shutdown, an electrical differential pressure system will also shut down the system in the event of the VF-609 filter becoming blocked.

Ball valve isolation is fitted on the inlet and outlet as well as an anti-syphon non return valve before the outlet. The system was designed for continuous duty with a zenon beacon for alarm indication and BMS outputs for all alarm states.

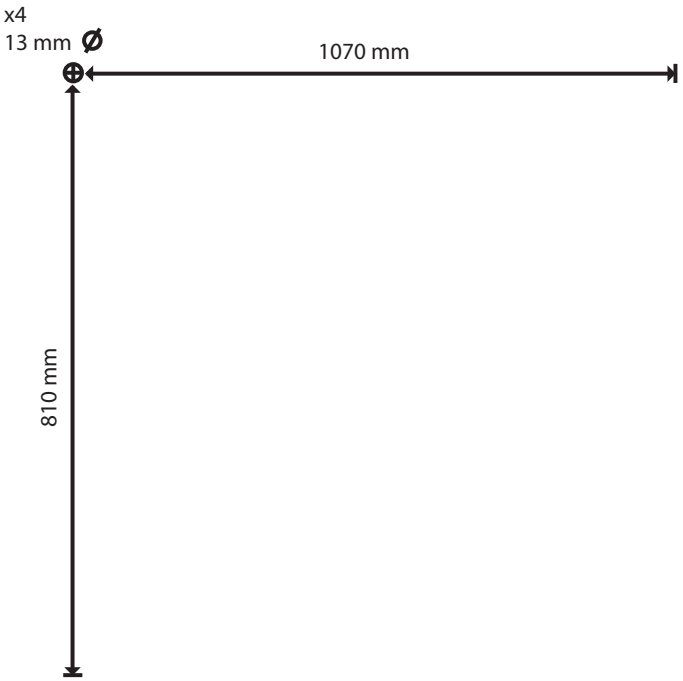
Specifications

Model	FRB-49312-SP
Width	1000 mm
Depth	275 mm
Height	1000 mm
Weight	75Kg
Wall mount	Mild Steel
Finish	powder coat
Voltage	240 VAC ±5%
Frequency	50 Hz ±2%
Current	2.9 Amps
Power	0.25 kW
Motor Protection	Single phase motors are provided with an automatic thermal protection switch
Pump	?
Noise level	<70dB @ 1m from the pump under normal working conditions
Duty cycle	Continuous
Filtration	Water removal / Particulate removal
Bypass (pump)	26 psi (1.8 bar)
Filter Indicator	Electrical / Front panel
Pressure	6 bar max
Temperature	-10°C - 90°C
Flow	50 l/min
Medium	Diesel
Environment	IP55
Connections	1" BSPP (F)
Safety	Remote Emergency stop

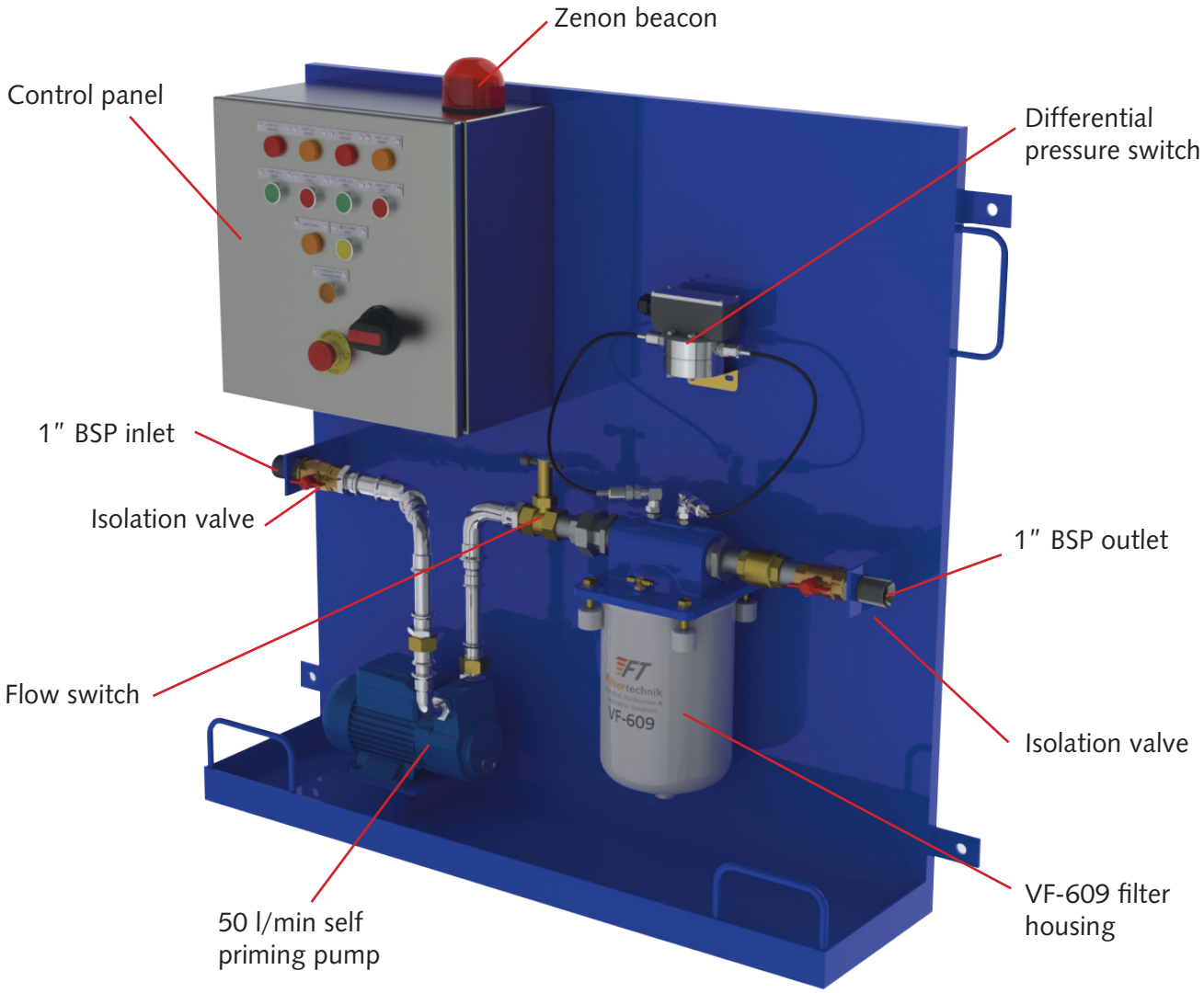
Fluid circuit diagram

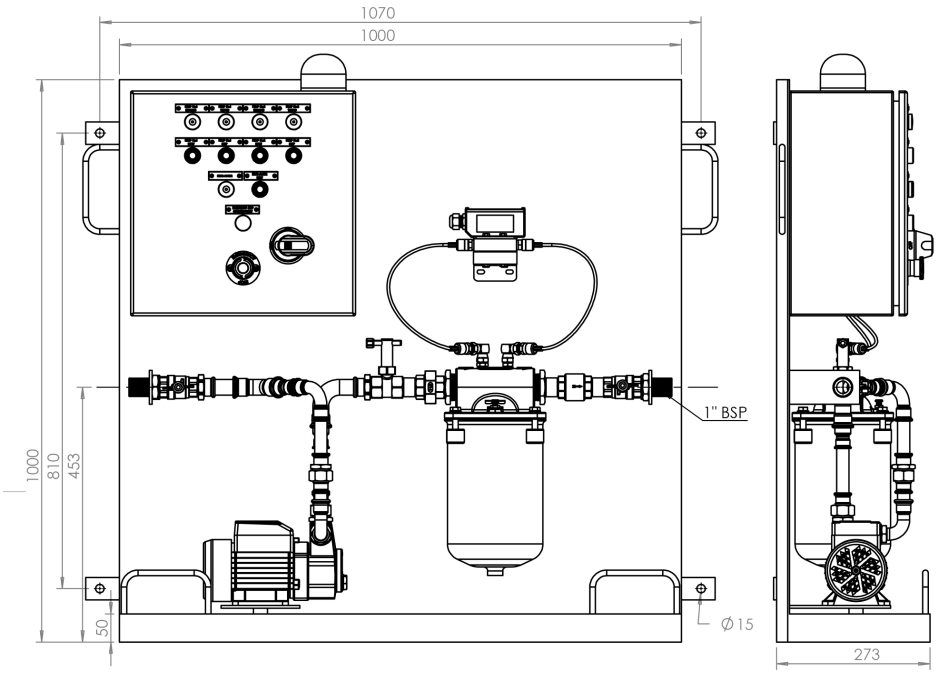


Mounting dimensions



Anatomy


Zenon beacon
Control panel
Differential pressure switch
1″ BSP inlet
Isolation valve
1″ BSP outlet
Flow switch
Isolation valve
VF-609 filter housing
50 l/min self priming pump
VF-609


1070
1000
1000
810
453
50
1" BSP
Ø15
273

Operation

Priming:	With an empty suction tube and the pump wetted with fluid, the electric pump unit is capable of suctioning the liquid with a maximum difference in height of 1.5 meters. It is important to point out that the priming time can be as long as one minute.
Pump Inlet Pressure:	When the FRB-49312 series is functioning, the pump can work with a maximum pressure at the inlet of 0.5 bar. Pump inlet pressure beyond this value will lead to cavitation, a consequent reduction in system flow rate and increase in system noise.
Permitted Use:	Diesel fuel at a viscosity of from 2 to 5.35 cSt (@ 37.8 Deg C) Minimum Flash Point (PM): 55 Deg C

Not permitted:	related dangers:
Gasoline	fire - explosion
Inflammable liquids with pm < 55o c	fire - explosion
Liquids with viscosity > 20 cst	motor overload
Water	pump oxidation
Food liquids	contamination of the same
Corrosive chemical products	pump corrosion Injury to persons
Solvents	fire - explosion Damage to gasket seals

Health, Safety & Environmental Considerations:

Caution, inappropriate use of this equipment can cause serious injury. Only competent and authorised persons should be permitted to operate this equipment. Children/minors should NEVER be permitted to operate or move this equipment.

This product should only be used for its intended purpose. Using this product for any other than its intended purpose could result in serious injury or death.

Always use appropriate safety equipment eg. Safety glasses, Protective gloves, Safety shoes etc. Observe local health and safety requirements.

Prolonged contact with diesel fuel can damage the skin. The use of safety glasses and protective gloves is recommended.

Only use this product with DIESEL FUELS having a viscosity of between 2 & 5.35 cSt (@ 37.8 Deg C) and a minimum Flash Point (PM) of 55 Deg C. It must not be used for any other liquids.

Never start or stop the pump by inserting or removing power supply or other plugs.

Do not operate switches with wet hands.

Only use on a flat even surface.

Always disconnect the equipment from the mains electrical supply before carrying out any routine maintenance or repairs.

Do not run the pump dry. This can cause serious damage to its components.

Periodically check the power supply cable for damage.

Observe local environmental requirements & ensure there is appropriate equipment available to clear up any accidental diesel fuel spills.

Special consideration should be given when this equipment is used in a marine environment.

Ensure used filters are disposed of following local environmental requirements.

Ensure any water drained from this equipment is disposed of following local environmental requirements.

Do NOT open or attempt to open the control panel unless you are qualified to do so, risk of electric shock and death.

IPU is an environmentally aware company. Always ensure that any used filters (or coalesced water removed from the filter bowl) are disposed of according to local environmental requirements.

Basic description:
Diesel fuel is known to be inherently unstable. Solids begin to form, condensation introduces water and the accumulating tank sludge will eventually clog engine filters and potentially damage fuel injection equipment leading to un planned maintenance and potential engine failure.
FRB-49312 on tank fuel polishing system must always be used in conjunction with a suitable biocide and a rigorous fuel management program. The system will condition and stabilise the fuel, remove water and tank sludge and eliminate microbial contamination from fuel tanks.
The FRB-49312 type fuel polisher is designed to be used as a system for the "polishing" of diesel fuels having a viscosity between 2 & 5.35 cSt (@ 37.8 Deg C) and a minimum Flash Point (PM) of 55 Deg C. It must not be used for any other liquids.

WARNING: The FRB-49312 series is designed to be used as a static "on tank" polishing system and should be permanently mounted either on a suitable wall or stand within the bund of the tank to which it is operating on. The system is NOT designed to be mobile and should not be used as such. It should only be installed by suitably qualified personnel.

Timer instructions

ET1624HD / PM
Operating **Instructions**

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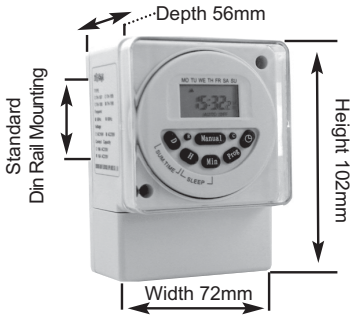
Airport Way
Luton, Beds, LU2 9NH
Tel: 01582 692 440 / Fax: 01582 692 450
e-mail: sales@europacomponents.com
website: http://www.europacomponents.com

Important notice to installers!

Before installation work starts the operating instructions should be read and understood. If you need technical assistance please contact the manufacturer at the address shown on this leaflet.

Installation of this unit should only be undertaken by a skilled electrician working to the standards set by the latest edition of the **IEE** wiring regulations.

The unit is designed to withstand reasonable levels of interference from external sources such as voltage peaks in the electricity supply. If however the supply is known to be subject to unusual level of interference then measures to protect the device from this need to be taken by the installer. Similarly the output relay is designed to switch a resistive load. If inductive or capacitive loads need to be switched it is suggested that a suitably specified slave device such as a contactor or relay be used to carry out the switch duty.



Electrical connections
- 240V mains supply to terminals 1 & 2
- Switched, volt free, output is across terminals 3, 4 & 5 where terminal 3 is common.
- The switch across terminal 3 & 4 is made when the timer is ON
- The switch across terminal 3 & 5 is made when the timer is OFF

Mounting the ET1624HD Din Rail Mounting Unit
The device is rated at IP 20 and as such provides finger protection but no immunity to fluids. It is designed to be fitted on a Din rail within a suitably IP rated enclosure. Visit **www.europacomponents.com** to select an enclosure from the broad range on offer.

Efforts should be made to ensure that the device is not subjected to undue vibration. Methods such as resilient mounting of the enclosure should be employed to keep levels to a minimum.

Mounting the ET1624HDPM Panel Mounting Unit
- Remove lid by undoing the fixing screws ❶&❷
- Cut panel hole: **67 x 67 x 67 x 67mm**
- Locate the main body of the timer (Fig A) under the panel
- Connect the terminals as required beneath the panel (before re-attaching the lid)
- Secure in position be re-attaching the lid, sandwiching the panel between the lid and the body of the timer. Using a screw driver turn out the secure holding tags ❸&❹

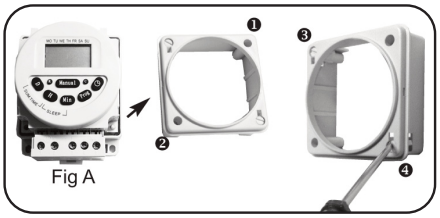


Fig A

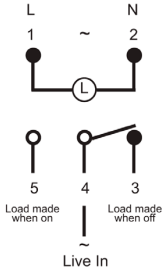
Technical Data

Supply Voltage	230Volts 50/60Hz AC
Output relay rating	16Amps AC1 resistive
Output relay type	Single pole changeover (volt free)
Power consumption	<2VA
Set Period of relay	1 min to 168 Hours
Time Error	<±0.5 Seconds per Day
Ambient temp range	-25°C to +60°C
Operating Humidity	<95%

ET1624HD / PM

Initial setup
In order to programme the unit the internal battery will need to be charged. To do this you will need to connect a live feed to the unit for about ten minutes. The set up procedure can then be done with the power disconnected.

Please Note: The product may arrive in ***"sleep mode"***. To wake up the timer press the R button once.



Guide to the Programming Keys

Button 'D'	Sets the Day
Button 'H'	Sets the Hour
Button 'Min'	Set the number of minutes
Button 'Prog'	Enables Programming
Button 'R'	Resets the device / wakes the timer from "sleep mode".
Button 'C'	Cancels the last function
Button 'Manual'	Sets the device to ON-AUTO-OFF
Button 🕒	Master clock

Setting the master clock
Press the clock button 🕒 and hold down whilst also pressing the following buttons.
Press the 'D' button until the triangle on the top of the screen moves to the correct day as shown at the top of the picture frame.
Press the 'H' button until the correct hour is shown on the 24 hour clock
Press the 'Min' button until the correct number is displayed
Note the clock display is 24 Hour only

Timer instructions

What the timer can do
Up to 16 ON/OFF periods can be set for each day of the week.
Any one period can be set between 1 Minute and 168 Hours
To simplify the setting of the day or days that are required there are a number of preset combinations of days within the programme.
They are as follows:

- Every day of the week
- Monday to Saturday inclusive
- Monday to Friday inclusive
- Saturday and Sunday only
- Monday, Tuesday & Wednesday
- Thursday, Friday & Saturday
- Monday, Wednesday & Friday
- Tuesday, Thursday & Saturday
- Individual days of the week such as Monday etc

To Programme the Timer
Press the 'Prog' button & release it.
Set the day of days that you require the timer to operate from the list already described. The triangles at the top of the screen will show which days have been selected.
Press the 'H' button to set the hour that you want the timer to operate at.
Press the 'Min' button to set the minute that you want the timer to operate at.
Press the 'Prog' button again and the OFF time can be set using the same method as setting the ON function just described above.

The timer will return to the master clock screen if no buttons are pressed for 30 seconds.

You have now set one ON/OFF period (#1).
To set additional periods press the 'Prog' button and then again to scroll to period#2 On , then again to #2 OFF and so to #16 if required.
To exit the programme function press the clock button (🕒) this will return you to the master clock screen.

Enabling the programme to run
Press the 'Manual' button and the display will change from ON to ON-AUTO.
Pressing again will move to OFF and subsequent pressing will move to OFF AUTO and then again to ON.

To run the programme the timer needs to be set to either ON-AUTO or AUTO-OFF.
If you are setting the timer to run during a period when the timer is programmed to be off then the AUTO-OFF setting needs to be displayed.

If you are setting the timer to run during a period when the timer is programmed to be on the ON-AUTO setting needs to be displayed. IF ON or OFF are displayed the timer will not operate to the programme set (see manual operation).

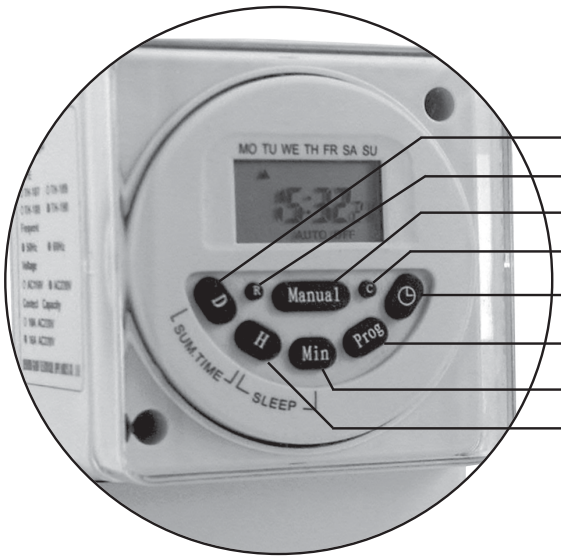
Cancelling programme periods
To cancel any programmed ON/OFF period. Press the 'Prog' button repeatedly until the Period number is shown that you wish to cancel or change. Press the 'C' button and the screen will clear.
You will then be able to re-programme this period or leave it blank. Remember to clear both the ON and OFF instructions for any one period.

Resetting the timer clock
Pressing the button marked 'R' will completely clear the master clock and all programmed periods in the memory of the device.

Manual Operation
Press the manual button to set the device to ON or OFF. This will override any programs that are set and force the timer into the set state ie ON =on and OFF =off

Summer Time advance & winter time retard
Press the 'D' & 'H' button together and hold down for 10 seconds to move the master timer forward by one hour. |The display will show a '1h' symbol in the top right hand corner.
Pressing the two buttons again will move the displayed time back and the '1h' symbol will no longer be displayed.

Switching the timer off and clearing the menu
Pressing the 'H' & 'Min' buttons at the same time for ten seconds will switch the timer off. The clock settings and all programmed events will be cleared. To switch back on press the small 'R' button.



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Element removal

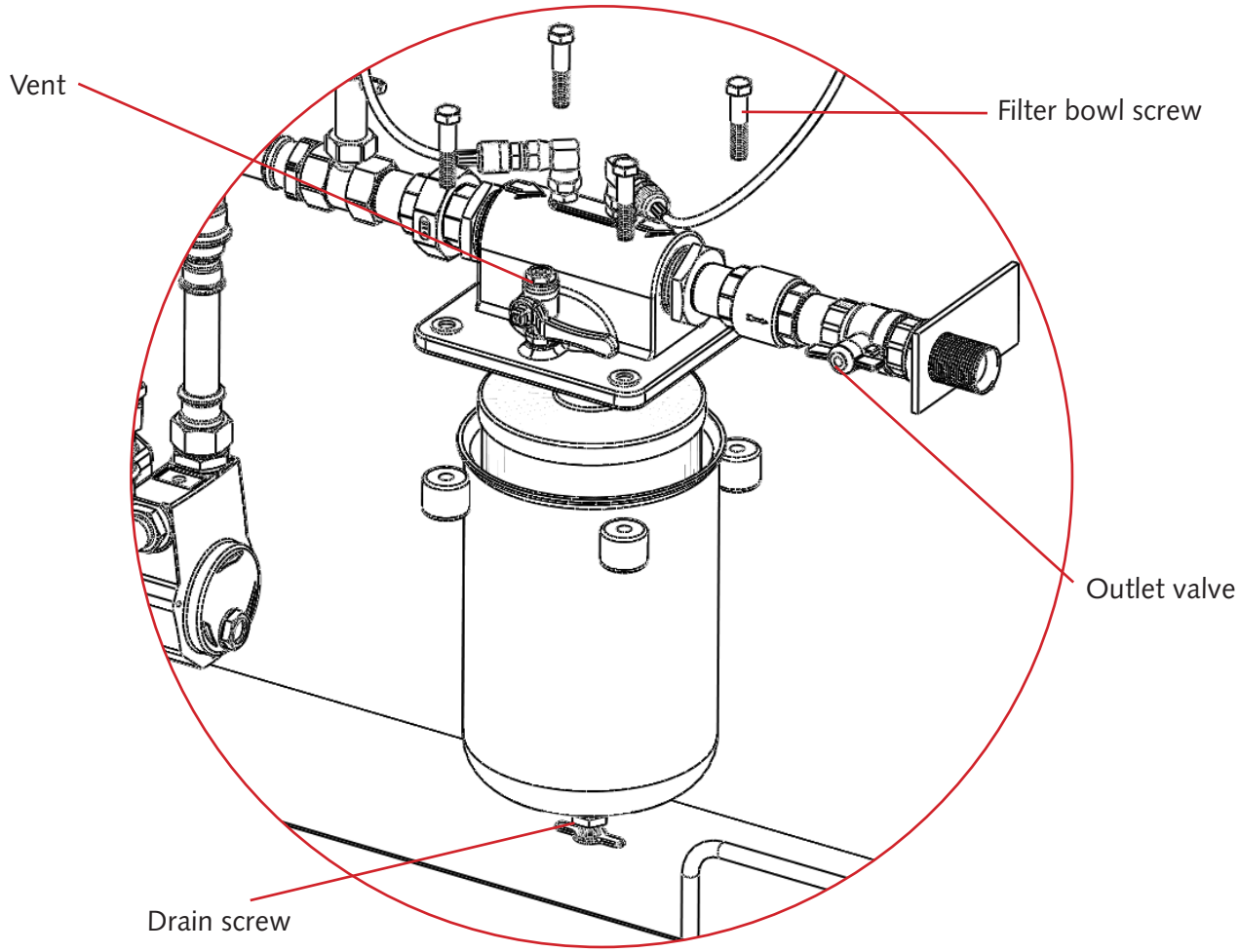
1. Ensure the system is free of fuel before element removal, this is done by closing the supply valve to the unit and running the system for a few seconds to purge any remaining fuel from the pipes.

2. Close the outlet valve and drain the remainder of the fuel via the drain valve opening the vent will reduce the time this takes.

3. Once the filter housing is empty remove the four bolts which secure the bowl to the filter head. With your hands supporting the bowl allow it to move downwards exposing the filter element. The spent element can now be removed, the bowl cleaned out and a new element fitted.

4. Once the element is replaced secure the bowl back to the filter housing via the four bolts.

5. Finally ensure the vent and the drain screw are returned to closed position, open the outlet valve and the system is ready for use once again.



VF-609
INSTRUCTIONS

DESCRIPTION

The Velcon VF-609 filter housing is designed to operate with ***Aquacon®*** cartridges as well as OS Series coalescer/separator cartridges. The filter housing is shipped with ***no cartridge*** installed. ***Cartridges must be ordered separately. See page 4 for cartridge selection table.***

Connections Size: 1-1/2" NPT
Housing Pressure Rating: 150 psi

NOTE: *FOR LIQUID SERVICE ONLY.* Do not use or leak test this filter vessel with compressed air or other gases.

IMPORTANT SAFETY PRECAUTIONS

- **To protect the fuel system, including the VF-609 and other components, BE SURE TO INSTALL PRESSURE RELIEF VALVE(S).**
- **MAKE CERTAIN FILTER HOUSING IS COMPLETELY VENTED BEFORE OPENING HOUSING.**
- To prevent electrical buildup and discharge - use a grounding wire to place a bonding loop from the drain valve to a point on the metal framework of the vehicle or skid. This provides a continuous bond. Before draining the vessel, electrically bond a metal container to the drain valve using a grounding wire. Then drain the fuel into the bonded metal container.

INSTALLATION PROCEDURES

Install the housing at a convenient point in the line. Note the arrow markings on the cast head which indicate direction of flow. DO NOT install the housing backwards.

NOTE: Fuel “weeping” from the inlet or outlet 1-1/2” NPT connections sometimes occurs when regular pipe dope is used when plumbing the vessel. To prevent “weeping”, we recommend a product like Loctite No. 59231 “Pipe Sealant with Teflon®”.

Install the 1/2" NPT petcock drain valve which is shipped loose in the shipping carton to the bottom of the vessel. An optional 1/2" NPT carbon steel ball valve, part number 554Y020, is available at extra cost.

It is good practice to install a differential pressure gauge so that the differential pressure across the housing can be monitored. This allows accurate determination of when the cartridge should be changed. Part number 07-224 is a differential pressure gauge specifically designed to be used on VF-609.

For ***Aquacon®*** cartridges used in aviation fuel or diesel fuel service, ***always*** install a differential pressure gauge or other means of determining the differential pressure. For diesel fuel service, flow rate should be kept between 15 and 30 gpm.

On systems where pressures can exceed 75 psi, a pressure bypass around the pump should be installed to protect the cartridge and the system from a high pressure shock or sudden cartridge seal-off due to a slug of water in the product.

Valves ahead of and behind the housing may be required to isolate it during cartridge change-out.

CARTRIDGE CHANGE-OUT INFORMATION

For OS Series Fuel Service – NOTE: The OS Series coalescer cartridge has an O-ring at the bottom of the cartridge. This O-ring seals to the inside of the housing. The cartridge fits tightly into the bowl and will require fuel or oil pre-lubrication to insert into the bowl.

**** DRAIN SUMP AT EVERY FUELING. ****

Replace the cartridge when the differential pressure exceeds 15 psi, after 1 year of service, when the flow is significantly reduced, or if differential pressure has been steadily climbing and then begins to decrease – whichever occurs first. After changing cartridges circulate flow through vessel for at least 3 minutes, use millipores to check for fibers and also check hose end strainers.

For Aviation Fuel Service – Please refer to cartridge Operating Procedures that are supplied with each cartridge shipment.

For All Other Applications – Replace the cartridge when the differential pressure exceeds 25 psi, after 1 year of service, when the flow is significantly reduced, or if pressure has been steadily climbing and then begins to decrease – whichever occurs first.

CARTRIDGE CHANGE-OUT INSTRUCTIONS

REMINDER: Be sure equipment is properly bonded before and after cartridge change-out is performed.

1. Close isolation valves (if any) and open the vent valve at the top.

3. Drain all liquid from the housing through the bottom drain.

4. Unbolt the four bolts holding the vessel shell to the head, drop the housing shell, and remove the spent cartridge.

5. Wipe the inside of the shell clean of any contaminants.

6. Inspect the O-ring and replace if damaged. Lightly lubricate the O-ring with the fuel or oil it will be used in, and position it on the head.

7. Install a new element onto the nozzle of the filter head. Twist and push the cartridge until it bottoms against the step on the nozzle.

8. Position the shell in place and screw the four bolt assemblies (with lock washers and flat washers) through the head and into the shell lugs. Tighten to 22 ft. lbs. maximum.

9. Close the drain valve, and open isolation valves. Open the vent valve until the vessel is slowly bleeding air from the top vent. Close the vent when the housing has filled.

10. Check all fittings and the head/shell junction for leaks.

REPLACEMENT PARTS

The VF-609 is shipped with a Buna-N O-ring installed. Some fuels, especially unleaded gasoline, may cause excessive swelling of the O-ring. If this is a problem, a Viton O-ring should be used. When ordering replacement O-rings from Velcon, specify:

G-0565	for Buna-N
G-0565A	for Viton

Replacements can also be obtained from any commercial supplier of O-rings. Specify size 2-362 in the desired material.

WARNING: Absorbent-type monitor cartridges will not remove water from fuel containing alcohol-blending agents (commonly called gasohol). For removal of solids, please use Velcon particle removal filters specifically made for gasohol. Consult your Velcon representative.

OPERATING INSTRUCTIONS - ENGLISH

These pumps are recommended for pumping clean water, water with a moderate impurity load (NGA, PRO-GA, PRO-NGA, HF, NF) and chemically non-aggressive fluids. They must be used in compliance with local laws.

CAUTION! Before installation and use read the following instructions carefully. The manufacturer declines all responsibility in the event of accident or damage due to negligence or failure to observe the instructions described in this booklet or in conditions that differ from those indicated on the rating plate.

It also declines all responsibility for damage caused by improper use of the water pump.

SAFETY

Before carrying out checks or doing any maintenance, clear the system by disconnecting the voltage and unplug the pump from the socket.

The water pumps comply with the Directives 2006/42/EEC, 2006/95/EEC, 2004/108/EEC, 2002/95/EEC including the latest amendments.

Before installing the water pump, make sure that the power supply mains is earthed and complies with regulations.

During operation the motor can get hot: be careful.

They are not suitable for pumping inflammable liquids or for operating in places where there is danger of explosion.

Avoid contact between the power supply and the liquid to be pumped.

The water pump must never be lifted or transported by its supply cable.

The norm EN 60335-2-41 sets out what follows:

1) the pump used for cleaning and other swimming pool maintenance purposes should not be used when there are people in the pool and

must be operated through a residual current device (RCD) with a rated residual operating current not exceeding 30 mA.

2) the pump for outdoor fountains, garden ponds and similar places must be supplied through a residual current device (RCD) with a rated residual operating current not exceeding 30 mA.

3) for pumps meant to be used in swimming pools and pumps to be used for outdoor use the supply cord should not be any lighter than "H07 RN-F" (245 IEC 66 denomination).

The appliance is not to be used by children or persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction. Children should be supervised to ensure that they do not play with the appliance.

PRELIMINARY INSPECTION

Unpack and check that it is in perfect condition.

CAUTION! Also check that the data on the rating plate correspond to the required data. If there is any problem contact the supplier immediately, specifying the type of fault.

CAUTION! If there is any doubt about the safety of the machine, do not use it.

CONDITIONS OF USE

The following conditions must be observed when using the water pump:

Maximum operating pressure: 10 bar (6 bar up to P2= 0.75 kW) (18 bar x PQ3000).

Maximum liquid temperature allowed, as per norm EN 60335-2-41: +35 °C

Maximum liquids temperature allowed for materials used: +60 °C (+40 °C for models with plastic impeller or other plastic components that comes into contact with liquids)

Voltage variation allowed: ±5% (if a field of nominal values is indicated, these are to be considered as minimum/maximum values allowed)

Uniform and continous level of acoustic pressure: [≤ 75 dB(A) for P2 up to 2.2 kW] - [≤ 85 dB(A) for any other P2]

Make sure that the pump works in its rated operation range

INSTALLATION

Installation can be a fairly complex operation.

It must therefore be carried out by competent and authorized installers.

CAUTION! During installation apply all safety regulations issued by the competent authorities and use common sense at all times.

Install the pump in a dry and well-aired place.

With the appropriate bolts secure the pump to flat solid surfaces to avoid vibrations.

The pump (VL, VLE) can be installed either vertically or horizontally.

Horizontal installation is recommended.

The pump (PKS, JSW, JCR, CK, CKR, JDW, PLURIJET, BETTY) must be installed in a horizontal position.The suction diameter of the piping should be no less than the pump inlet diameter.

If the suction height is more than 4 metres, use a larger diameter.

The pipe must have a slight upward slope towards the suction inlet to avoid air getting trapped.

Make sure that the pipe is perfectly air-tight and that it is submerged at least 50 cm in the liquid to be pumped in order to avoid the formation of eddies.

CAUTION! The pump can be damaged if it operates with leaks in the suction pipes. A foot valve must always be fitted to the end of the suction tube.

The ejector unit should be installed in wells with diameter no less than 4", 3" or 2" according to the model.

It is connected to the pump body by means of two pipes with internal diameters no less than the internal diameters of the corresponding inlets and outlets.

A foot valve must always be fitted to the end of the ejector suction tube, submerged at least 50 cm in the liquid to be pumped in order to avoid the formation of eddies.

The flow rate and pressure available at the points of utilization depend on the diameter of the delivery pipe.

For installations with very long delivery pipes, leaks may be reduced by using a diameter greater than that of the pump outlet.

It is advisable to install a check valve after the pump delivery outlet so that maintenance can be carried out without having to empty the delivery pipe and also to avoid water hammering if the pump suddenly stops.

This is a necessary precaution when there is a water column of more than 20 metres on the delivery side.

Pipes should be anchored so that no stress of any type is transmitted to the pump. When laying the pipes ensure that protruding seals and burrs inside do not reduce the cross-section required for passage of the flow.

Screw the pipes to the corresponding openings without forcing them in order not to cause damage.

ELECTRICAL CONNECTIONS

They are delivered ready to be connected.

CAUTION! It is the installer's responsibility to perform the connections in compliance with the regulations in force in the country of installation.

Make sure that there is no voltage at the line wire terminals before connecting.

Check that the data on the rating plate corresponds to the rated line values.

Connect up the pump (making sure that there is an efficient earth circuit) according to the diagram below the terminal box or on the identification plate.

The earth wire must be longer than the live wires, and must be the first wire to be connected when the pump is being set up and the last to be disconnected during disassembly.

If a pump is not equipped with a supply cord and a plug, the power supply network should include a cut-off device or system having a contact separation of at least 3 mm in all poles. If a pump is provided with a supply cord and a plug, the pump must be positioned so that the plug is accessible.

It is advisable to install a residual current device (RCD) with a rated residual operating current not exceeding 30 mA.

A thermal overload cutout in the winding protects against voltage overload in the single-phase pump motors up to 1.50 kW.

Three-phase motors must be protected by the user.

For three-phase motors, check that the rotation direction is clockwise by looking at the pump from the fan side. If not, invert two of the phases.

For three-phase motors (VL, VLE) the rotation direction may be inverted; in this case performance is much lower than the rated values.

In order to check whether the connection is correct, proceed as follows:

a) pump to be installed: when started up, the pump tends to rotate in an anticlockwise direction seen from above;

b) pump installed and submerged in the fluid to be pumped: measure the current absorbed by the pump when working using a snap-on ammeter; if the direction of the rotation is incorrect, the values will be approximately double those indicated on the rating.

To invert the direction of rotation simply invert two of the phases.

PRIMING

CAUTION! Dry operation of the pump will damage the mechanical seal.

This operation is performed via the priming plug, by filling the pump casing (as well as the suction pipe for no self-priming pumps) with the liquid to be pumped in.At the end of the operation, screw the plug back on and start the pump.

CAUTION! If, after about ten minutes the pump (PKS, CK, CKR, JSW, JCR, JDW, PLURIJET,BETTY) is still not primed, switch it off and repeat the operation.

Priming must be repeated whenever the pump has not been used for a long time or, for no self-priming pumps, when air has entered in the system.

MAINTENANCE

Before doing anything, make sure that the pump is disconnected from the power source and that there is no possibility of accidental connections.

Repair of the pump by personnel not authorized by the manufacturer will render the guarantee null and void and will entail operating with potentially dangerous equipment.

CAUTION! Any tampering may lead to performance being reduced and danger to persons and/or things.

The pumps do not require any maintenance as long as the following precautions are taken:

Where there is the risk of freezing, empty the pump and remember to re-prime when used again

Frequently check that the foot valve (check valve for PKS) is clean

If the pump is not going to be used for a long time (for example, in winter), it is advisable to empty it completely, rinse it with clean water and store in a dry place

DECLARATION OF CONFORMITY

We hereby declare, under our exclusive responsibility, that the product in question complies with the provisions of the following community directives, including the latest amendments, and with the related assimilated national legislation:

2006/42/EEC, 2006/95/EEC, 2004/108/EEC, 2002/95/EEC

CK self-priming electropumps with liquid ring

RANGE OF PERFORMANCE

Flow rate up to 50 l/min (3 m³/h)
Head up to 51 m

LIMITS OF USE

Manometric suction height up to 9 m
Liquid temperature up to + 90°C (+55°C for diesel fuel/mazut)
Environment temperature up to + 40°C

EXECUTION AND SAFETY STANDARDS

EN 60 335-1	EN 60034-1
IEC 335-1	IEC 34-1
CEI 61-150	CEI 2-3

CE

USES AND INSTALLATIONS

THEY ARE RECOMMENDED FOR PUMPING DIESEL FUEL/MAZUT, CLEAN WATER WITHOUT ABRASIVE PARTICLES AND LIQUIDS THAT ARE CHEMICALLY NON AGGRESSIVE FOR THE MATERIALS OF WHICH THE PUMP IS MADE. THANKS TO THE SPECIFIC OPERATING PRINCIPLE THEY ARE A GOOD SOLUTION IN ALL CASES WHERE A COMPACT SELF-PRIMING PUMP IS NEEDED OR WHERE THE FLOW OF LIQUID IS POOR OR IRREGULAR OR MIXED WITH AIR.

The pumps must be installed in enclosed places, or at least protected against inclement weather.

GUARANTEE 1 YEAR subject to our general terms of sale.

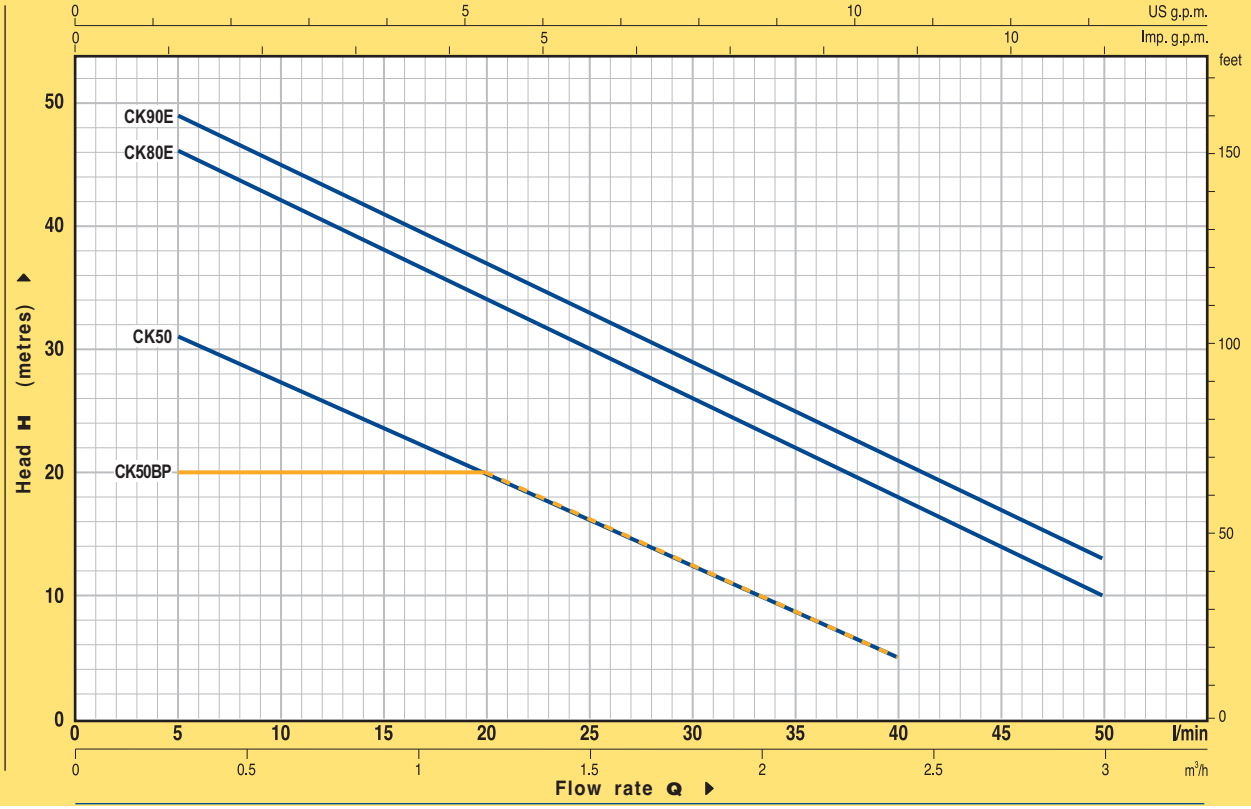
CONSTRUCTION CHARACTERISTICS

- **PUMP BODY: cast iron**, with threaded inlets ISO 228/1.
- **LANTERN (patent n° 1289150): aluminium** with front shim disk in **brass**; reduces starting difficulties due to blockage of the impeller after long periods of inactivity.
- **IMPELLER: brass** of the star type with open radial vanes.
- **MOTOR SHAFT: stainless steel EN 10088-3 - 1.4104.**
- **MECHANICAL SEAL: ceramic - graphite - VITON.**
- **ELECTRIC MOTOR:** the pumps are coupled to a PEDROLLO electric motor with specially calculated dimensions, silent-running, closed, with external ventilation, suitable for continuous duty.
  CKm: single-phase 230 V - 50 Hz with condenser and thermal overload protector built into the winding .
  CK: three-phase 230/400 V - 50 Hz.
- **INSULATION:** class F. • **PROTECTION:** IP 44.
- **REGISTERED MODEL**

EXECUTIONS ON REQUEST

⇒ **CKm/INT** electropumps with switch and power cable with Schuko plug
⇒ **CKm 50-BP/NZ** electropumps with aluminium spray gun and 4 metre hose reinforced with a steel spiral .
⇒ special mechanical seal
⇒ other voltages or frequency 60 Hz
⇒ protection IP 55

CURVES AND PERFORMANCE DATA AT n= 2900 1/min

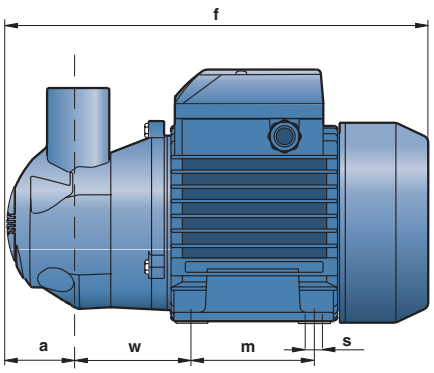


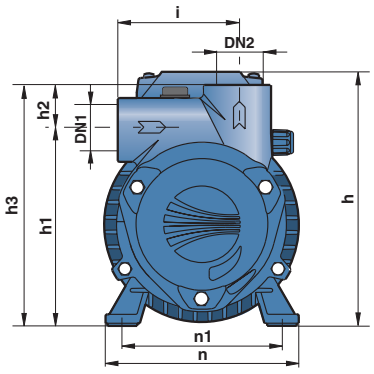
TYPE		POWER		Q m³/h	0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	3.0
Single-phase	Three-phase	kW	HP	l/min	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**50**
CKm 50	**CK 50**	0.37	0.50	H metres	35	31	27	24	20	16	13	9	5	
CKm 50-BP	**CK 50-BP**	0.25	0.33		20	20	20	20	20	16.5	13	9	5	
CKm 80-E	**CK 80-E**	0.60	0.85		48	46	42	38	34	30	26	22	18	10
CKm 90-E	**CK 90-E**	0.75	1		51	49	45	41	37	33	29	25	21	13

Q = Flow rate **H** = Total manometric head

Tolerance of the performance curves according to EN ISO 9906 App. A.

DIMENSIONS AND WEIGHTS





TYPE		INLETS		DIMENSIONS mm												kg	
Single-phase	Three-phase	DN1	DN2	a	f	h	h1	h2	h3	i	m	n	n1	w	s	1~	3~
CKm 50	**CK 50**	3/4"	3/4"	41	260	159	128	25	153	75	80	120	100	69	7	7.3	6.8
CKm 50-BP	**CK 50-BP**			44	263												
CKm 80-E	**CK 80-E**	1"	1"	50	296	179	136	31	167	81	90	134	112	77		11.6	10.8
CKm 90-E	**CK 90-E**															11.8	11.0

Filtertechnik Ltd Warranties Statement

All products manufactured or distributed by Filtertechnik Ltd are subject to the following, and only the following, Limited Express Warranties, and no others:

For a period of one (1) year from and after the date of purchase of a new Filtertechnik product, Filtertechnik warrants and guarantees only to the original purchaser/user that such a product shall be free from defects of materials and workmanship in the manufacturing process. The warranty period for pumps and motors is specifically limited to ninety (90) days from the date of purchase. A product claimed to be defective must be returned to the place of purchase. Filtertechnik, at its sole option, shall replace the defective product with a comparable new product or repair the defective product. This express warranty shall be inapplicable to any product damaged or impaired by external forces or used for any purpose other then that for which it was originally sold.

THIS IS THE EXTENT OF WARRANTIES AVAILABLE ON THIS PRODUCT. FILTERTECHNIK SHALL HAVE NO LIABILITY WHATSOEVER FOR CONSEQUENTIAL DAMAGES FOLLOWING THE USE OF ANY DEFECTIVE PRODUCT OR BY REASON OF THE FAILURE OF ANY PRODUCT. FILTERTECHNIK SPECIFICALLY DISAVOWS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING, WITHOUT LIMITATION, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE (EXCEPT FOR THOSE WHICH APPLY TO PRODUCT OR PART THEREOF THAT IS USED OR BOUGHT FOR USE PRIMARILY FOR PERSONAL, FAMILY OR HOUSEHOLD PURPOSES), WARRANTIES OF DESCRIPTION, WARRANTIES OF MERCHANTABILITY, TRADE USE OR WARRANTIES OF TRADE USAGE.

Filtertechnik
Filtration, Purification & Separation Solutions

EC DECLARATION OF CONFORMITY

Machinery Description

Machine Type: FRB-49312-SP

Serial Number:

Applicable Directives

Low Voltage Directive 73/23/EEC (as amended by 93/68/EEC)
Electromagnetic Compatibilty Directive 2004/108/EC
Machinery Directive 98/37/EC

Declaration

We, Filtertechnik Limited, declare that the above referenced product(s), to which this declaration relates, is in conformity with the provisions of the Directives listed above.

IMPORTANT
This declaration is only valid when the machinery has been installed, operated and maintained in accordance with the applicable Installation, Operation and Maintenance Instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment.

The technical construction file for this product is maintained at the address given below.

Dated 07th May 2011

Mr D Whittaker, Engineering Director
Filtertechnik Limited, Unit 10 Easter Park, Lenton Lane, Nottingham, NG7 2PX, England.